REMARKS

No claims have been amended, added or cancelled. Claims 1-32 remain pending in the application. Reconsideration is respectfully requested in light of the following remarks.

Section 102(e) Rejection:

The Office Action rejected claims 1, 16, 17 and 32 under 35 U.S.C. § 102(e) as being anticipated by Welin (U.S. Publication 2002/0031086). Applicants respectfully traverse this rejection for at least the reasons herein below.

Regarding claim 1, Welin fails to disclose a memory coupled to a cell processing unit and configured to store one or more policy parameters and rollover data for each of the communication channels, wherein the rollover data comprises an indication of a rollover relationship between the timer value and one of the policing parameters for each of the communication channels. Instead, Welin teaches a method for sorting a queue of telephony packets by a deadline value for each packet by which that packet must be serviced or lost. The packets are then decoded in the resultant sort order (Welin, Abstract, paragraphs 0015, 0058 and 0080). The Examiner cites several portions of Welin that describe how packets are received, the type of hardware Welin's system can be implemented on, and that describe how Welin determines the deadline value for each packet, taking into account clock counter rollover. However, none of the cited portions discloses a memory configured to store rollover data *for each of the communication channels*.

Moreover, Welin does not store, or even calculate, rollover data for each communication channel, wherein the rollover data includes an indication of a rollover relationship between the timer value and one of the policing parameters for each communication channel. Instead, Welin calculates a deadline value for each packet corresponding to a time by which the packet must be serviced (Welin, paragraphs 0139,

0146, 0189). Welin does not disclose anything about storing rollover data for each communication channel. Instead, Welin calculates the deadline value for each received packet and sorts a queue of received packets according to the calculated deadline value for each packet. Thus, the packets in Welin's system can then be serviced from the queue in deadline order, thereby helping to ensure that packets with sooner deadlines are serviced before packets with later deadlines.

In response to the above arguments, the Examiner, in the Response to Arguments section of the Final Action, cites various paragraphs of Welin describing various components and features of Welin's system, none of which actually describes storing rollover data for each of the communication channels, wherein the rollover data includes an indication of a rollover relationship between the time value and one of the policing parameters for each of the communication channels. Instead, the Examiner cites paragraphs [0086] and [0092] that describe some of the physical component that may be part of Welin's system. Paragraphs [0015 – 0017], also cited by the Examiner, provide a partial summary of Welin's system including the computing of deadline intervals for each received packet, as described above. The Examiner also cites paragraph [0058] describing how the time when a buffer containing voice data will run out of data is completely predictable. The Examiner specifically refers to Welin's description in paragraph [0058] regarding the temporal relationship between the arrival time of a packet and the time by which it must be decoded and added to the data stream. However, this "temporal relationship" is nothing more than the computed deadline value, described above. The Examiner further cites paragraph [0154] describing a "FIFO" memory model of buffering in which "all data is always shifted toward the output" and "[e]ach time a data element is withdrawn from the memory, all remaining data is shifted forward". The Examiner additionally cites paragraphs [0518-0520] describing circular buffers, the primary objective of which is "to provide means of resynchronization of data between mutually asynchronous data sources and sinks". Welin also states, in this cited passage, that an additional role of circular buffers in packet telephony is to provide buffering." Paragraphs [0547] and [0548], also cited by the Examiner, describe using circular time (i.e. using timers that rollover), such as the need to select a desirable clock rate and a

corresponding clock cycle period and an estimate of the largest interval of time that ever needs to be maintained by the system. And finally, the Examiner cites paragraphs [0550] and [0558]. Paragraph [0550] describes a 16-bit address counter for a buffer that is initially reset and begins to count the sampling clocks and that each arriving packet can be associated with the current time t_{now}. Paragraph [0558] describes how when using circular time, time values used in comparisons can straddle the system clock modulus time boundary, producing false results, which is a form of rollover error. Clearly, none of these passages describes rollover data for each communication channel, wherein the rollover data includes an indication of a rollover relationship between the timer value and one of the policing parameters for each communication channel.

The Examiner seems to be arguing that by describing any use of a system that includes timers that rollover, Welin is also somehow disclosing the specific limitation of claim 1 of a memory configured to store one or more policing parameters and rollover data for each of the communication channels. However, as shown above, none of the cited passages of Welin makes any mention of such policing parameters or of rollover data for each of the communication channels. Moreover, none of the cited passages makes any mention of rollover data including an indication of a rollover relationship between the timer value and a policing parameter for each of the communication channels. Merely describing how circular timers work and how one must be aware of rollover in general does not in any way disclose, teach, or even suggest rollover data for each of the communication channels, wherein the rollover data includes an indication of a rollover relationship between the time value and one of the policing parameters for each of the communication channels.

Additionally, Welin also fails to disclose that for each received incoming data cell, the cell processing unit is configured to assign an arrival time from the timer value and compare the received incoming data cell's arrival time to the one or more policing parameters for the received incoming data cell's communication channel to determine if the received incoming data cell is conforming or non-conforming to a rate for the communication channel, as recited in claim 1. The Examiner cites various

passages of Welin that describe how a packet's deadline value is calculated, including accounting for clock rollover. However, Welin does not teach comparing a packet's arrival time to policing parameters for the packet's communication channel to determine if the packet is conforming or non-conforming to a rate for the communication channel. Instead, as noted above, Welin calculates a deadline value for each received packet and uses those deadline values to sort and service the packets in order by their respective deadline values (Welin, paragraphs 0139, 0146, 0189 and 0551-0556).

In response to this argument, the Examiner again cites many of the same paragraphs cited in the rejection of claim 1, but also cites paragraph [0154] describing a "FIFO" memory model of buffering in which "all data is always shifted toward the output" and "[e]ach time a data element is withdrawn from the memory, all remaining data is shifted forward". Applicants' fail to see the relevance of this discussion. Welin's description of how FIFO buffers work has absolutely no relevance to comparing a packet's arrival time to policing parameters for the packet's communication channel to determine if the packet is conforming or non-conforming to a rate for the communication channel. Once again the Examiner fails to provide any explanation or interpretation, but merely cites various and irrelevant portions of Welin. For example, the Examiner cites paragraphs [0550] and [0555] describing in general terms how circular time comparison work. The Examiner also cites [0253] which describes, again in general terms, how packet of voice data that are lost or arrive too late may be replaced with silence, decay, noise, or interpolated data. The Examiner is again presumably arguing that by disclosing general qualities regarding time and packet flow, Welin somehow also discloses comparing a packet's arrival time to policing parameters for the packet's communication channel to determine if the packet is conforming or non-conforming to a rate for the communication channel. The Examiner fails to point out or cite any portion of Welin that actually describes or mentions comparing a packet's arrival time to policing parameters for the packet's communication channel.

Furthermore, Welin does not disclose that the cell processing unit is configured to access the rollover data for the received incoming data cell's

communication channel to account for the rollover relationship when comparing the arrival time to the one or more policing parameters, as recited in claim 1. Nowhere, either in the Examiner's cited passages or elsewhere, does Welin mention accessing *rollover data* for a received packet's communication channel. Welin does not calculate or maintain rollover data for communication channels. Instead, Welin maintains time-stamp values of deadlines for each non-serviced packet (Welin, paragraphs 0080, 0139, 0146, 0189).

In response to this argument, the Examiner cites many of the same paragraphs described above, but also cites paragraphs [0080] and [0140]. Paragraph [0080] describes how Welin's link list queue "tells the system which packets to decode first, in order of their deadline number" and further describes how Welin's system "access the cell at the top of the queue 1431, and thereupon detects what process to use and for what channel and triggers decode of the frame in the corresponding packet." Applicants fail to see the relevance of the portions of Welin cited by the Examiner. Welin's description of accessing and decoding packets in order of their deadlines from a linked list queue has absolutely no relevance to accessing rollover data for a received data cell's communication channel to account for the rollover relationship when comparing the cell's arrival time to policing policies.

Paragraph [0140] of Welin describes how for any arriving packet, Welin's system access addresses bf_{out} and bf_{in} and computes the current reserve R_x for that channel. Welin teaches that bf_{out} is the address of the next sample to be retrieved and sent to a DAC and that bf_{in} is the address of the "future first data word of the next packet's frame". Welin also teaches that between the two addresses "is data ready to be sent out to create the voice stream", is the data reserve R_x, or the amount of data to be sent before the channel runs out of data. Thus, the Examiner has cited a paragraph describing how Welin determines how much data in a buffer remains to be sent out, which has nothing to do with accessing rollover data for a data cell's communication channel. Thus, the Examiner clearly fails to cites or point out any portion of Welin disclosing, teaching or suggesting a cell processing unit that is configured to access the rollover data for the

received incoming data cell's communication channel to account for the rollover relationship when comparing the arrival time to the one or more policing parameters, as recited in claim 1.

Thus, claim 1 is clearly not anticipated by the cited art and removal of the section 102(e) rejection is respectfully requested. Remarks similar to those above regarding claim 1 also apply to claim 17.

Regarding claim 16, Welin fails to disclose a network device configured as an Asynchronous Transfer Mode (ATM) switch for the plurality of communication channels, wherein each communication channel is an ATM virtual channel. The Examiner cites paragraph [0313] where Welin describes an embodiment of his invention that includes asynchronous channels, but does not mention a network device configured as an ATM switch. Merely describing asynchronous decoding of channel packets is not the same as actually disclosing a network device configured as an ATM switch. If fact, nowhere does Welin describe anything that can be considered to be configured as an ATM switch. Furthermore, Welin does not describe, either at the Examiner's cited passage or elsewhere, communication channels that are ATM virtual channels. Thus, Welin clearly fails to anticipate a network device configured as an Asynchronous Transfer Mode (ATM) switch for the plurality of communication channels, wherein each communication channel is an ATM virtual channel.

Therefore, the rejection of claim 16 is not supported by the prior art and removal thereof is respectfully requested. Similar remarks also apply to claim 32.

Section 103(a) Rejection:

The Office Action rejected claims 2-4, 6-15 and 18-31 under 35 U.S.C. § 103(a) as being unpatentable over Welin in view of Fahmi et al. (U.S. Patent 5,668,797)

(hereinafter "Fahmi"). Applicants respectfully traverse the rejection of claims 2-4, 6-15 and 18-31 for at least the reasons below and for the reasons presented above regarding their respective independent claims.

Regarding claim 2, Welin in view of Fahmi fails to teach or suggest that the rollover data is configured to indicate for each communication channel whether or not the timer value and theoretical arrival time are in the same rollover phase. The Examiner admits that Welin does not teach or suggest rollover data configured to indicate for each communication channel whether or not the timer value and theoretical arrival time are in the same rollover phase. The Examiner relies up Fahmi and cites several passages including column 2, lines 62-67; column 3, lines 27-32, and 62-65; column 4, lines 1-5, 19-29 and 53-58. However, none of the Examiner's cited passages mentions rollover data configured to indicate for each communication channel whether or not the timer value and theoretical arrival time are in the same rollover phase. Instead, Fahmi teaches that the arrival time of a particular cell is compared to that cell's theoretical arrival time (TAT) to determine that cell's conformance. Fahmi clearly describes this process at column 1, lines 59-65 as "determining if a theoretical arrival time TAT is less than an arrival time for a ... cell." Additionally, one of the Examiner's cited portions (column 2, lines 62-67) also describes how Fahmi "tests a cell k arriving at time $t_a(k)$ ... by comparing a theoretical arrival time, TAT, with the cell arrival time, $t_a(k)$." The other passages cited by the Examiner describe the different ways taught by Fahmi for comparing the TAT and actual arrival time of individual cells of data.

In response to the above arguments, the Examiner cites some of the same passages of Fahmi discussed above. Additionally the Examiner cites column 1, lines 59-65 of Fahmi that describes determining whether the theoretical arrival time (TAT) is less than the arrival time of a cell. However, this passage makes no mention of rollover phases or rollover data configured indicate for each communication channel whether or not the timer value and theoretical arrival time are in the same rollover phase.

Furthermore the Examiner contends, in the Response to Arguments, that paragraph [0058] of Welin teaches "that values are in the same rollover phase" specifically citing Welin's statement regarding a "temporal relationship between the time of arrival of a packet and the time it has to be decoded and added to the data stream." However, as discussed above, this "temporal relationship" is nothing more than Welin's deadline values for packets and has nothing to do with rollover data indicating for each communication channel whether or not the timer value and theoretical arrival time are in the same rollover phase. Instead, this paragraph merely describes the fact that each packet has a deadline by which it needs to be decoded to prevent a communication channel from running out of data, but says nothing about rollover data or rollover phases.

The Examiner also cites paragraphs [0130-0134] of Welin in the Response to Arguments. This passage describes three of Welin's observations, namely 1) that if an arriving packet is to be included in a voice stream, that packet's data must be decoded and put into a buffer before the buffer's reserve runs out, 2) that the quality of voice communication can be improved if the order or processing of packets is made to depend on the needs of each channel, and 3) that the measure of a channel's needs is the channel's reserve (i.e. how much data is left to be sent out). Once again, Applicants fail to see the relevance of the Examiner's cited passage.

The Examiner additionally cites, in the Response to Arguments, paragraph [0373] where Welin teaches how each packet contains 80 samples when it arrives and how a phase lock loop enhances clock recovery to reconstitute the clock for resampling, "because of clock discrepancies in a big network". This passage of Welin does not mention, describe, or teach anything about rollover data configured indicate for each communication channel whether or not the timer value and theoretical arrival time are in the same rollover phase.

As noted above, nowhere does Fahmi (or Welin) mention rollover data configured to indicate for each channel whether or not the timer value and the theoretical arrival time are in the same rollover phase. Instead, as noted above, Fahmi teaches comparing the

theoretical and actual arrival times for individual cells to determine conformance and thus whether or not to apply policing to individual cells. Thus, Welin and Fahmi, both singly and in combination, fail to teach or suggest rollover data configured to indicate for each channel whether or not the timer value and the theoretical arrival time are in the same rollover phase. Therefore, the rejection of claim 2 is not supported by the cited art and removal thereof is respectfully requested. Remarks similar to those above regarding claim 2 also apply to claim 18.

Regarding claim 6, Welin in view of Fahmi does not teach or suggest a memory configured to store operations and maintenance data indicating connection availability information for each communication channel. The Examiner cites paragraphs 0318 and 0620 of Welin. However, neither of the cited passages have any relevance to storing operations and maintenance data indicating connection availability information for each communication channel. Instead, paragraph 0318 of Welin describes decrementing deadlines every 10 ms as part of maintenance of queue 1431. Paragraph 0318 also describes how the DMA (direct memory access) hardware of Welin's system is programmed to continually put data from a T1 incoming line into buffers and to further take data from the buffers and place it on a T1 outgoing line. Paragraph 0620 describes replacing a speech codec in appliances and talking toys.

The Examiner does not rely upon Fahmi nor does Fahmi overcome any deficiency of Welin regarding claim 6. Thus, Welin and Fahmi, both singly and in combination fail to teach or suggest a memory configured to store operations and maintenance data indicating connection availability information for each communication channel.

In the Response to Argument section of the Final Office Action, the Examiner additionally cites paragraphs [0256], [0259] and [0310] of Welin. Paragraph [0256] describes dealing with packets of silence. Specifically, Welin teaches, at paragraph [0265] how silence packets are routed to a post-processing block and how silence causes post-processing to transfer silence directly to the output buffer (or to other buffers) thus

filling certain spaces in the output buffer with data corresponding to silence. Welin also states that the postprocessing updates channel records and increases a delay by the number of milliseconds of silence, "thus acting as a source of maintenance of channel records." However Welin is refer to maintain the proper timing, such as the delay mentioned, in channel records. Welin is clearly no describing storing operations and maintenance data *indicating connection availability information* for each communication channel.

Paragraph [0259] describes performing maintenance of the deadline interval entry in the channel record by updating within the product of the number of frames of silence multiplied by the frame length. This paragraph describes perform maintenance of a channel records, as described above, but does not mention any maintenance data indicating connection availability information.

Paragraph [0310] of Welin describes how if the number of microseconds needed to perform an egress task were underestimated, "then all that would happen is that the system would lose a few packets down deep in the 10 ms queue because at that point the maintenance would decrement all the time intervals and throw away everything that had not been processed in the 10 ms queue." Once again the Examiner's cited passages have no relevance to the argument at hand. Paragraph [0310] like the other cited paragraphs does not mention, nor does it deal with, nor is it relevant to, storing operations and maintenance data indicating connection availability information for each communication channel.

In short, none of the Examiner's cited portions have any relevance to storing operations and maintenance data indicating connection availability information for each communication channel. Therefore, the rejection of claim 6 is not supported by the prior art and removal thereof is respectfully requested. Remarks similar to those above regarding claim 6 also apply to claim 22.

Regarding claim 7, Welin in view of Fahmi fails to teach or suggest a timer rollover indicator configured to be set when the timer value rolls over. The Examiner cites paragraph [0528] of Welin. However, this passage of Welin discusses the relative addresses of packets, including out-of-order packets in Welin's circular buffer. The cited paragraph des not make any reference to any timer rollover indicator configured to be set when the timer value rolls over.

Welin in view of Fahmi further fails to teach or suggest wherein the timer rollover indicator is cleared upon completing a scan in which the update of the rollover data is performed for each communication channel. The Examiner cites paragraphs [0341], [0262], [0417] and [0630] of Welin. However, none of these paragraphs describes a timer rollover indicator being cleared upon completing a scan. Instead, paragraph [0341] describes part of Welin's description of implementing a de-skewing buffer regarding there being "no difference between 29 msec of 'active' silence, as opposed to 29 msec of silence". Paragraph [0262] describes the use of Welin's egr_in_use variable that indicates whether a particular egress channel record in currently in use. Paragraph [0417] describes how Welin's system processes incoming voice data including determining whether a next packet frame represents voice or silence and updating a register 2414 to indicate a value representative of the elapsed time of the decode process. Paragraph [0630] discusses how Welin fills holes in the memory reserve of a channel buffer includes determine a packet's sequence number equals the address of the hole and filling the hole by putting new data from the packet into the hole. Thus, none of the Examiner's cited passages makes any reference to a timer rollover indicator that is cleared upon completing a scan.

The Examiner does not rely upon Fahmi in the rejection of claim 7 and Fahmi fails to overcome the deficiencies of Welin discussed above. Thus, the combination of Welin and Fahmi fails to teach or suggest wherein the timer rollover indicator is cleared upon completing a scan in which the update of the rollover data is performed for each communication channel. For at least the reasons above, the rejection of claim 7 is not supported by the prior art and removal thereof is respectfully requested.

The Office Action rejected claim 5 under 35 U.S.C. § 103(a) as being unpatentable over Welin and Fahmi in further view of the "Official Notice". Applicants respectfully traverse this rejection for at least the reasons given below.

Regarding claim 5, Welin in view of Fahmi in further view of the Examiner's "Official Notice" does not teach or suggest a network device wherein a timer rollover phase indicator comprises a global register bit configured to be toggled each time the timer value rolls over. The Examiner cites paragraph [0417] of Welin. However, the Examiner's cited passage describes how Welin's system processes incoming voice data but does not mention anything regarding a timer rollover phase indicator comprising a global register bit configured to be toggled each time the timer value rolls over. Instead, the cited passage describes using the decoding of voice data itself as a timer of the progress of the decode process. For instance, Welin states, "[i]f the decoder process 2403 has to process 160 samples of data, the process itself every 20 samples or so may be arranged to open itself up to be interrupted" (Welin, [0417]). Paragraph [0417] of Welin also describes using a register to store the progress of the decoder process by indicating the number of samples processed by the decoder process. However, Welin does not teach or suggest a timer rollover phase indicator comprising a global register bit configured to be toggled each time the timer value rolls over.

The Examiner also cites Fahmi and argues that Fahmi teaches n bits encoded to indicate whether the theoretical arrival time value for the communication channel is ahead, behind or in the same rollover phase as the timer value. However, the Examiner's cited portion (column 4, lines 12-18) of Fahmi fails to mention any bits encoded to indicate whether a theoretical arrival time for a communication channel is ahead, behind or in the same rollover phase as the timer value. Instead, Fahmi teaches a time-of-arrival counter that provides n-bits of output that *indicate the actual arrival time* of a cell. Fahmi states "[t]he time of arrival on bus line 50 is applied to an input of processor 54 giving the processor 54 the time of arrival for each cell" (Fahmi, column 4, lines 16-18).

Thus, Fahmi teaches the determination of the actual arrival time for each arriving cell of data. Fahmi is silent regarding any bits encoded to indicate whether a theoretical arrival time for a communication channel is ahead, behind or in the same rollover phase as the timer value.

Further regarding claim 5, the Examiner's argument taking "Official Notice" that toggling register bits is well known has no relevance to the rejection of claim 5, since, as noted above, Welin and Fahmi fail to teach or suggest any value that indicates that the theoretical arrival time value for a communication channel is ahead, behind or in the same rollover phase as the timer value. Thus, whether or not toggling register bits is well known has no bearing on validity of the Examiner's rejection of claim 5. In other words, the Examiner's "Official Notice" regarding the toggling of register bits does not overcome the deficiencies of both Welin and Fahmi (singly and in combination) regarding indicating whether the theoretical arrival time value for the communication channel is ahead, behind or in the same rollover phase as the timer value. Furthermore, although it may be well known to toggle register bits for other purposes in the prior art, Applicants traverse that it is well known in a network device for a timer rollover phase indicator to comprise a global register bit configured to be toggled each time the timer value rolls over.

In the Response to Arguments section of the Final Action, the Examiner responds to the above arguments by asserting that Welin teaches a timer roller phase indicator comprising a global register bit configured to be toggled each time the timer value rolls over and cites paragraph [0194] of Welin. However, paragraph [0194] of Welin does not describe anything regarding a global register bit configured to be toggled each time the timer value rolls over. Instead, paragraph [0194] describes how the current "NOW" value in Welin's system can be defined as when a packet arrives is determined in terms of the number of samples until the current frame's ending boundary. Thus, as noted above, the cited paragraph does not teach or suggest anything regarding a global register bit configured to be toggled each time the timer value rolls over.

The Examiner also cites paragraph [0329] where Welin describes how a 10 ms DMA interrupt "sets the rhythm" of Welin's system. Specifically, every 10 ms Welin's system reset frame boundaries and schedules the ingress and updates all of the egress deadlines. Presumably the Examiner is referring to the fact that Welin's system includes a new egress packet flag that may be set (as described in paragraph [0653]) when new packets arrive and need to be scheduled for decoding. Paragraph [0329] describes how the each 10 ms the new egress packet flag is reset. This resetting of Welin's new egress packet flag is clearly not a bit configured to toggled each time the timer values rolls over. Instead, this flag is set whenever a new packet arrives and is reset every 10 ms.

The Examiner further cites paragraphs [0417] – [0419], [0542] and [0550-0555] of Welin which are equally irrelevant, and fail to mention, a timer rollover phase indicator comprising a global register bit configured to be toggled each time the timer value rolls over.

Thus, the rejection of claim 5 is clearly not supported by either the prior art or the Examiner's "Official Notice" and removal of the rejection is respectfully requested.

Applicants also assert that numerous other ones of the dependent claims recite further distinctions over the cited art. However, since the independent claims have been shown to be patentably distinct, a further discussion of the dependent claims is not necessary at this time. Applicants reserve the right to later present additional arguments if necessary.

CONCLUSION

Applicants submit the application is in condition for allowance, and notice to that effect is respectfully requested.

If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert, & Goetzel, P.C. Deposit Account No. 501505/5694-00200/RCK.

Also enclosed herewith are the following items:

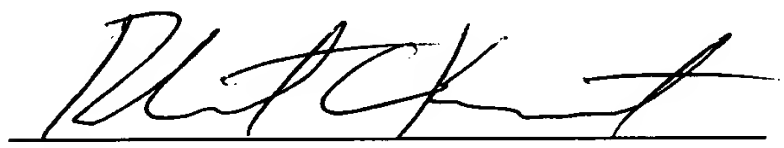
☒ Return Receipt Postcard

☐ Petition for Extension of Time

☐ Notice of Change of Address

☐ Other:

Respectfully submitted,



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Date: July 15, 2005